NEESit and OpenSees Parallel on Teragrid Machines

Karan Bhatia, PhD
NEESit Project Manager

OpenSees Parallel Computing Workshop, April 18th, 2008

George E. Brown, Jr. Network for Earthquake Engineering Simulation
NEES Cyberinfrastructure Center at the San Diego Supercomputer Center, UCSD
Submit applications SOON!
NEEScentral

- Create projects, experiments/simulations,
- Collaborate with others,
- Share data results,
- Publish when ready.

Data ingestion

repository

Long term preservation
publication

export

George E. Brown, Jr. Network for Earthquake Engineering Simulation

NEES Cyberinfrastructure Center at the San Diego Supercomputer Center, UCSD
Demonstration

Data Model
Teragrid

- **Apply for access to allocation**
  - [http://it.nees.org/support/supercomputing/](http://it.nees.org/support/supercomputing/)

- **Machines**
  - **DataStar P655**
    - DataStar has 272 8-way P655+ compute nodes -- 176 nodes with 1.5-GHz Power4+ CPUs and 16 GB of memory, and 96 with 1.7 GHz Power4+ CPUs and 32 GB of memory.
  - **DataStar P690**
    - DataStar has 6 32-way P690 compute nodes with 1.7 GHz Power4+ processors. Five nodes have 128 GB of shared memory, and one node has 256 GB of memory.
  - **TG-SDSC IA64**
    - SDSC’s TeraGrid cluster is composed of 262 IBM Itanium2 nodes with two processors per node.
  - **ABE**
    - This Dell blade system has 1,200 PowerEdge 1955 dual socket, quad core compute blades, an InfiniBand interconnect and 100 TB of storage in a Lustre filesystem.
  - **BlueGene**
    - The IBM Blue Gene system at SDSC is housed in three racks with 3072 compute nodes and 384 I/O nodes.
  - **Ranger**
    - The Ranger Sun Constellation Cluster is configured with 3,936 four-socket, quad-core AMD Opteron nodes (62,976 compute cores) and 125 TB of distributed memory.
Applications

- Abaqus
- LS-Dyna
- Fluent
- OpenSees
- Ansys
- *P
- Mathematica
NEES Allocation

- **245,000 SU Allocation Oct 1 2007 - Sept 2008**
  - Up from 200,000 su’s the year before
- **~125,000 remaining (April 2008)**
  - Usage up, p655 18619 -> 32100, p690 669 -> 1626, ia64 64 -> 25000 (first quarter 2007 -> 2008)
- **Number of users**
  - 31 groups 76 users
    - Up from 66 (30 groups) users the year before
Allocation and Usage
Summary

- [http://it.nees.org/](http://it.nees.org/)
  - [http://it.nees.org/support/supercomputing/](http://it.nees.org/support/supercomputing/)
  - Email [it-support@nees.org](mailto:it-support@nees.org)
- **NEEScentral**
  - [http://central.nees.org](http://central.nees.org)
  - Get account, start recording simulations and sharing with community
- **Teragrid Resources**
  - [http://www.sdsc.edu/us/resources/](http://www.sdsc.edu/us/resources/)
  - [http://www.teragrid.org/userinfo/hardware/](http://www.teragrid.org/userinfo/hardware/)

- **HAPPY (PARALLEL) Computing!!**